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A Review on Improvement of Road Accident Black Spots Using Corridor Approach

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Abstract: ***This paper talks about the Improvement method of road accident black spots. In this study we have used one of the pronounced method of Black spot analysis i.e. Corridor analysis in which whole section is divided in no. of segments and then improvement of black spots is done in sequential manner of each segment. By following this technique hazardous nature of whole stretch is rectified in a sequential order making whole stretch safe from one side which cannot be done in conventional method of black spots improvement. At last we have concluded our study by suggesting remedial measures for each black spot to make it safe.***
Keywords: Black spot, Corridor Analysis, Accident, Improvement, National Highways.

I. INTRODUCTION

Road accidents continue to be a leading cause of death, disabilities and hospitalization in the country despite our commitment and efforts. Accident rate in India is higher like other developing countries. During the calendar year 2020, road accident in India claimed about 1.3 lakh lives and caused injuries to more than 3.4 lakh people [1]. An accident Black spot is a section of road where the frequency of occurrence of several types of accidents or a particular type of accident is comparatively higher than other similar sections on different roads. For rectification of such road sections, it is important to identify such locations based on likelihood of occurrence of an accident and past accident history.

II. NEED OF STUDY

Due to continuous increase in road accidents it becomes important for transportation authorities to identify and reduce the hazardousness in accident-prone locations, and this can effectively be done with the help of improvement of Black spots locations.

III. OBJECTIVE OF STUDY

The objectives of the present study are:

1) Collect & Analyze various type of road accidents data of NH- 152 on selected stretch.
2) Identify accident Black spot locations on the basis of accident data using GIS Technique.
3) Analysis of Black spot locations using Corridor Approach.
4) Suggest various Remedial measures for different blackspots locations.

IV. LITERATURE REVIEW

Many academicians and researchers have carried out some studies in the related area. The findings of these are presented.

Kowtanapanich W. et al. (2005) [2] proposes a supportive approach called public participation approach to overcome the problem of accurate accident data collection. They demonstrate how a public participation approach can be used to assist in identifying black spot locations through the framework of an Accident Public Participation Program (APPP).

Elvik R. (2008) [3] conducted a survey of operational definitions of hazardous road locations in eight European countries and comparison is done on basis of characteristics like population reference, technique used, deviance from normal level of safety, accident severity and length of period use. He found that most operational definitions of hazardous road locations rely on a sliding window approach, identified locations in terms of the recorded number of accidents.

Meuleners M. et al. (2008) [4] evaluates the effectiveness of the Black Spot Programs in Western Australia. They assessed crash rate at the treated locations and the economic benefits of these treatments.

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The results showed that the programs have been effective overall in reducing reported crash rate by 15% which results in saving of 50.8 million Australian dollars, of which 89% could be attributed to the reduction in casualty crashes.

Sadeghi A. et al. (2013) [5] identify and prioritize accident-prone sections using Data Envelopment Analysis (DEA) method based upon efficiency concept to emphasize accidents with regard to traffic, geometric design and environmental circumstances of road. The comparisons demonstrated that the frequency and severity of accidents would not be only considered as the main factors for black-spots identification but proper rating can be possible by obtaining inefficiency values from this method for the road sections. This approach could applicably offer decision-making units for identifying accident-prone sections and their prioritizations.

Keymanesh M. et al. (2017) [6] attempted to identify and prioritize the accident prone points in Iran, with use of Analytic Hierarchy Process (AHP), which is the enhanced procedure of road safety audit technique. They concluded that this method can be used wherever accident information and statistics are not properly recorded due to either lack of required facilities or inadequate training of the registering agents.

Bisht L. and Tiwari G. (2019) [7] assesses the effectiveness of the policies focused on the identification and rectification of black spots on the NHs in our country. Further, it highlights the strengths and weaknesses of policies based on the outcomes of the audit conducted to review the road safety status on Indian Highways. This study presented the current scenario of the policies pertaining to black spots in the country and recommends the measures to improve the safety at black spots location.

V. GAPS IN LITERATURE

After going through the study carried out by different authors, the following gaps have been identified

1) Most of the research studies did not consider underreporting of accidental data.
2) There is not any single method of Blackspot Analysis which is applicable to all region.
3) Most of the researchers used Weighted Severity Index method for prioritizing Black spots locations in which Minor injuries are also considered. But in actual definition of Blackspot as per NHAI minor injuries were not considered. So this process challenges prioritizing criteria of Blackspots.
4) None of the researchers did characterization of Black spots with respect to Victim group to facilitate Victims and make Black spot less hazardous.

VI. RESEARCH METHODOLOGY

Research methodology involves following steps

1) Study for topic selection.
2) Performing thorough review of existing literature.
3) Data collection, which includes accident data and traffic volume data.
4) Performing data analysis of collected data.
5) Identification of Black spots location.
6) Analysis of identified black spots using Corridor approach.
7) Development of remedial measures and conclusion.

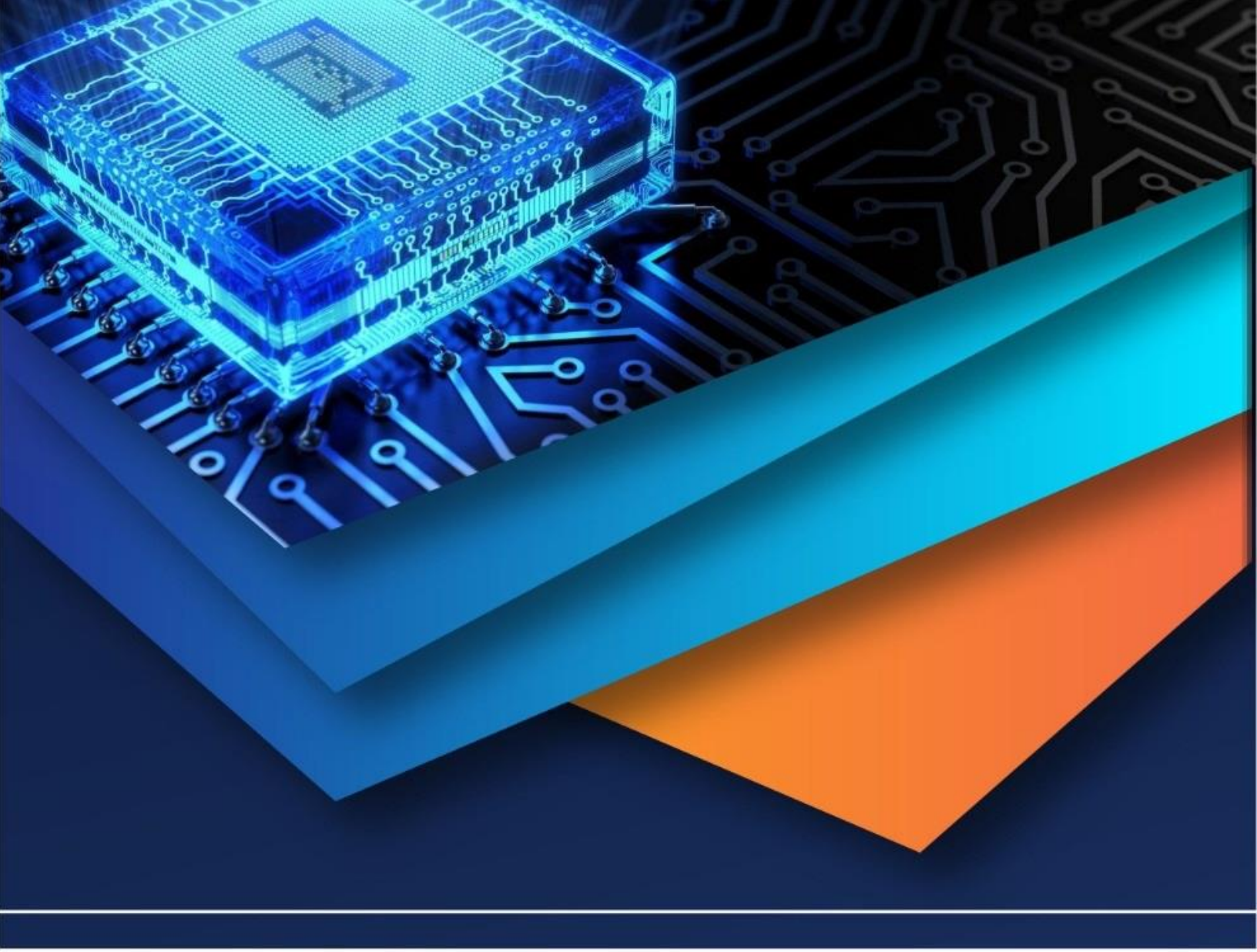
VII. EXPECTED OUTCOMES

After completion of the study, the following are expected outcomes

1) Suggested Methodology of Blackspot improvement under the cluster conditions will be developed.
2) The methodology thus followed shall result in minimization of accident rate at Black Spots location on selected stretch.

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